

The most recent available embedded data should be used in each year's support calculation. By using recent data, carriers and state commissions will be guaranteed that whenever a carrier upgrades facilities, new investment will promptly lead to increased federal support.<sup>39</sup> This can be important in areas where existing plant and service is inadequate. State commissions in some cases need as many tools as possible to encourage adequate investment. Indeed, current data on embedded investment may be of sufficient importance to justify using a projected estimate rather than historical data.<sup>40</sup>

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39. This will require the FCC to continue to collect data, such as ARMIS data, on investment and expenses for incumbent LECs.

40. This could be accomplished in the same manner that estimated costs are now used to set access charges under Part 69 of the FCC's rules. As is true under Part 69, periodic audits and a repayment mechanism would be needed for overpayments that resulted from inaccurate estimates of investment.

**C. Step 3 - Lesser of Above**

This step calculates the lesser of the results from Step 1 and Step 2. The effect of this step is to ensure that the need for support in a state is determined by the lower cost alternative as between building a new network and using the existing network. Limiting support to the lesser of forward-looking need or embedded need conserves federal financial resources and reduces the likely effect of any errors that might remain in the cost proxy models.

**D. Step 4 - Hold-harmless**

This step calculates a hold-harmless level for each state. It equals the greater amount from two calculations, Part A hold-harmless and Part B hold-harmless.

Part A hold-harmless is intended to ensure that no state, and no carrier, receives less support, per line, than it received under the old support system (support-based hold-harmless). The amount received by each state is the sum of three items:<sup>41</sup>

1. The projected High-Cost Support (NTS or "loop" support) to local exchange carriers;
2. DEM weighting for local exchange carriers that report their costs to the FCC; and
3. DEM weighting for "average schedule" local exchange carriers that have an average switch size of less than 500 lines.<sup>42</sup>

Part B hold-harmless protection is intended to ensure that the ratepayers in high-rate states are not further burdened by contributions to the new system. It is available only to states with above average costs, measured on an embedded basis, and thus presumably will benefit only states that already have high rates. Part B hold-harmless also applies only to states that presently make a net contribution to the federal high cost and loop support programs. That is, the customers in these states contribute more to these programs than the carriers in those states receive for support.

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41. A fourth item that was discussed but not specifically endorsed may be worthy of further consideration. Federal support could be used to reimburse the District of Columbia for its extraordinary support of telecommunications relay services related to Gallaudet College.

42. A data analysis performed for the National Telephone Cooperative Association suggests that the switching cost of serving a customer increases significantly when the switch size is less than 500 lines. Therefore, even though a local exchange company may prefer to have its costs calculated on an "average" basis, it may nevertheless have high switching cost if it has, on average, small switches. Overman, Richard, unpublished paper, *see Comments, National Telephone Cooperative Association*, CC Docket 80-286, Oct. 10, 1995.

For states meeting both of these criteria, Part B support is calculated to ensure that the net contribution of that state does not increase (contribution-based hold-harmless).<sup>43</sup> For states receiving Part B hold-harmless support, this support is in addition to hold-harmless support available under Part A.

#### **E. Step 5 - Greater of Above**

This step takes the larger of the results from Step 3 and Step 4. The effect is to set the hold-harmless level as the minimum support for each state. This is the final amount of federal support that would be available to ETCs within each state.

#### **F. State Distributions; State Plans**

The amount of support calculated in step 5 would be distributed in two portions, a hold-harmless portion and a discretionary portion. To the extent that federal support for the state equals the Part A (historical support) hold-harmless amount, that support would be distributed to eligible telecommunications carriers based upon prior federal support to that carrier.<sup>44</sup>

The second part of the distribution would apply to all federal support available to the state above the Part A hold-harmless amount. This discretionary portion could be distributed in three ways. One option would be for these discretionary funds to be distributed by USAC to state commissions and then further distributed by state commissions to ETCs. Alternatively, state commissions could exercise a power of appointment over the funds, deciding upon the amounts to be distributed, but relying on USAC to transfer the funds directly to the ETCs.

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43. Calculation of Part B support is complex, because it requires repeated estimations of support. Each change in Part B support for any state generally changes the size of the national fund. This in turn increases each state's contribution to the fund, and thus creates a need for even more Part B support. However, by repeatedly increasing Part B support for the approximately nine states affected, it is possible to achieve results at any desired level of accuracy.

44. This support could be transferred directly by the Universal Service Administrative Company to the ETC, pursuant to the commission's directions, or it could be transferred to the commission with the understanding that it would be further distributed to the ETCs.

Support would go to the incumbent LEC on a per line basis. Where a competitive LEC has taken over accounts formerly served by the incumbent, the hold-harmless benefits would be portable and would be paid to the competitive LEC.

The third option for distributing this discretionary support amount would be for the FCC, at its discretion, to direct a reduction in the subscriber line charge for ratepayers in a specific state. This option would ensure that ratepayers in the affected state are provided with the benefit of distributing these federal funds to maintain reasonably priced rates for basic local service.<sup>45</sup>

Each state commission would be required to submit a plan for distribution of federal discretionary support for FCC approval. A state commission submitting a plan under options 1 or 2 would describe the state commission's method of distributing federal funds. For options 1 and 2, commissions should be able to design methods that are specific to that state's needs, so long as the plan meets the statutory goal of ensuring reasonably comparable rates to urban areas.<sup>46</sup> In designing distribution plans under options 1 or 2, state commissions might want to consider several factors.

- a. A state plan might be designed to reflect that service areas and build-out responsibilities for competitive LECs in the state are larger than wire centers, and

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45. The third option would be limited to instances where a state has limited regulatory authority to require that Federal USF funds be directly passed to end users.

46. Two methods are described here for purposes of illustration.

Using Method A, the state commission would perform a support calculation for each ETC in the state. The support for each ETC would be based upon the difference between its average cost and a statewide cost threshold. Cost could be determined by a forward-looking cost model, an embedded cost model, or a blend of the two. Therefore, Model A could itself have a number of variants based on different combinations of forward-looking and embedded costs.

This is analogous to the method that the FCC would use to calculate support for the state as a whole, but with the difference that the state would adjust the statewide threshold cost parameter to ensure the distribution of all high cost funds, both state and federal, that are likely to be available. The total amount distributed would consist of federal hold-harmless support, federal discretionary support and any funds raised by the state.

Using Method B, as in Method A, the state commission would perform a support calculation for each ETC in the state, and once again the support for each ETC would be based upon the difference between its average cost and a statewide cost threshold. Each ETC would receive 100% of its hold-harmless amount plus a pro-rata portion of its other support need. The pro-rata portion would be the same for all ETCs in that state in a given year. As with Method A, the total amount distributed would consist of federal hold-harmless support, federal discretionary support and any funds raised by the state.

accordingly require a cost model operating at a geographic scale larger than the wire center.

- b. A state plan might be designed to reflect the geographic scale at which incumbent LEC wholesale prices are de-averaged.<sup>47</sup>
- c. A state plan might be designed around specific state policy objectives. For example, a state might want to promote investment in parts of a state needing to upgrade the quality of service or physical facilities.

Each plan under option 1 or 2 would also contain assurances necessary to distribute the funds efficiently and to meet federal policy objectives.

- a. The plan would state that the commission has authority under state law to distribute federal discretionary high cost support.<sup>48</sup>
- b. The plan would state whether the commission prefers to receive title to the funds or to have a power of appointment for the funds. If the commission prefers title, the plan should also describe whether the commission prefers to use a third party administrator to receive and account for federal support, and if so, should name that administrator.
- c. The plan would state that distributions of federal funds will be made only to ETCs for the purpose of defraying high local rates for universal service<sup>49</sup> in high cost, rural and insular areas.

The FCC would review state plans for distribution of federal funds. The FCC would require that such plans advance the objectives of Section 254 of the Telecom Act, including the requirement that rates and service in rural areas be reasonably comparable to those in urban areas. State plans would also need to be competitively neutral,<sup>50</sup> and should also ensure that each ETC

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47. For example, if a state has established three pricing zones for resale of services available from its regional Bell operating company, it might decide to establish the same three zones for calculation of high cost support.

48. The FCC might want to seek public comment on whether state commissions will require legislative authority to distribute federal funds in this manner. Some commissions may conclude that they presently have authority to so act, either under the Telecom Act or under existing state law. Others may need or may desire to seek explicit state statutory authority.

49. The elements of service required to be supported are defined in 47 U.S.C. § 54.101.

50. The competitive neutrality requirement might require that carrier support be "portable."

receives an amount of federal support at least equal to the hold-harmless portion that ETC has generated.

### **G. Individual Income Factors**

Average income might be used to adjust federal support levels. Support might be increased, for example, in states with a high incidence of poverty or states with a low average income. Low income ratepayers in many cases may also live in low cost areas, thus creating the appearance that poor individuals in low-cost areas are being required to subsidize rich individuals in high-cost areas. While using an income-based test may warrant further study, for the reasons discussed below, no income factor has been included in this proposal.

First, by collecting funds from interstate revenues, federal support will be raised in a progressive manner. This is because customers who use a high volume of interstate services will contribute proportionately more to the fund. These are generally business customers and higher income residential customers. It is unlikely, therefore, that low-income individuals, even in low-cost states, would be significantly burdened by this proposal.<sup>51</sup>

Moreover, high cost support is only one part of the program supported by the FCC's universal service mechanisms. Support for schools and libraries and support for the lifeline and link-up programs are specifically targeted to the needs of the educational and low-income communities. Indeed, much of the support under these programs flows to low-cost areas.

### **H. Subsequent Years.**

It was noted above that the most recent possible embedded data should be used in each year's support calculation. Indeed, it may be that the data should be so fresh that they should be estimated for the upcoming year.<sup>52</sup>

In addition, hold-harmless calculations should be updated annually. This will ensure that legitimate transactions now in progress will be reflected in the hold-harmless base. For example, although the FCC has forbidden further increases in high cost support through sale of exchanges to

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51. Moreover, as a practical matter, so long as the high cost support is funded by a surcharge on a class of service (i.e., "interstate") it would be impractical if not impossible to exclude contribution from low-income individuals who happened to use that class of service.

52. An auditing provision would also be needed. See footnote 30, above.

small companies,<sup>53</sup> some such sales have already been completed. It would be unfair to the carriers and customers in these states if the effects of completed and allowed telephone exchange sales were to be ignored in the hold-harmless calculation.<sup>54</sup>

### **I. Lifetime of the Plan.**

For a number of reasons, this model should be considered an interim solution. This is due in part to limitations in the model, and due in part to expected developments in the telecommunications industry.

The model includes embedded cost as a primary factor affecting the distribution of federal support. As facilities-based competition progresses, more and more investment will be made by competitive LECs. Competitive LECs do not, however, report their costs to the FCC, and these costs cannot be added to those filed by incumbent LECs. As facilities-based competitive LECs acquire a larger share of the local exchange market, their investment may become a significant share of the total investment in the public switched network. In that event, embedded cost data will increasingly understate total net investment, and any model that relies on average embedded cost in each state can become less reliable. When reported investment decreases to 70% or 80% of the total network, this model may need to be replaced, possibly by a bidding process.<sup>55</sup>

The model also includes, in Step 4, a hold-harmless calculation. Because of the methods that the FCC has used in the past to distribute federal support, this hold-harmless guarantee is primarily of benefit to smaller incumbent LECs. Many of these companies are rural telephone companies and are entitled to separate treatment under applicable FCC orders. To date, the FCC has not indicated any clear intent to reduce the support for these companies substantially and has

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53. This prohibition applies unless a carrier made a binding commitment before May 7, 1997 to purchase an exchange. Universal Service Order at ¶ 308.

54. This will require the FCC to continue to recalculate support under the existing system as though that system were still in effect. In particular, the FCC will have to calculate both high cost support and DEM weighting as though this plan had not been adopted.

55. The model bases support distributions for some states on the difference between the state's embedded average cost and the national average cost. Therefore, to the extent that a particular data error applies equally to all states, it could have a negligible effect on the distribution. However, at some time in the future, facilities-based competitive LECs may have so many lines that the embedded cost per line data from incumbent LECs will no longer represent a fair sample of the lines in the state. At that time the reported embedded investment would no longer be a reliable indicator of cost.

left this question to subsequent rulemaking.<sup>56</sup> Nevertheless, after the passage of several years, policy makers might attach reduced importance to sustaining the hold-harmless expectation indefinitely.

The telecommunications market itself may also evolve in unexpected ways. This could invalidate some of the assumptions underlying the FCC's current policy on high cost areas and could equally invalidate the assumptions underlying this model. For example, the FCC requires that high cost support be calculated on a fine geographic basis no larger than the wire center.<sup>57</sup> This presupposes that competitive LECs will be free in each state to offer their service areas on a fine geographic scale and also presupposes that resale rates will be de-averaged at a similar scale. As states implement the Telecom Act over the next several years, those assumptions may not prove accurate. In that event, it may be appropriate to calculate forward-looking support on a different geographic scale.<sup>58</sup>

Based upon these considerations, the FCC may want to reexamine this model after it has been in place approximately four years. It may be appropriate to make major changes to the model at that time or even to develop an entirely new model.

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56. The FCC has stated an intention to establish a forward-looking economic cost mechanism for rural carriers. Universal Service Order at ¶ 252. The FCC also has stated that it will not base distributions to rural carriers on forward-looking cost until further review. *Id.* at ¶ 203. However, the FCC has also stated that it intends to pay only 25% of the cost of support, and this presumably applies to both rural and non-rural carriers. *Id.* at ¶ 269.

57. *Universal Service Order* at ¶ 250(10).

58. Alternatively, competitive LECs may be able to identify low-cost and high profit customers within a wire center and avoid serving other higher cost or lower volume customers. In that event, even more geographically precise measurements of cost may be necessary.



## **V. Benefits**

The proposed plan offers numerous benefits.

### **A. Intrastate Purpose**

Under this plan, while the benefits vary from one state to another, all of the money produced would be used by state commissions to reduce intrastate rates. This is consistent with the purpose of the present high cost funding program and with the Act's requirement to achieve "reasonably comparable rates."

This plan is also more likely to produce reduced retail rates or to maintain existing rate levels. Under the May 8 order, high cost support is used to reduce interstate access charges. Therefore, the immediate beneficiaries of the FCC's program were interstate service providers who might then choose to pass these cost reductions along in the form of rate reductions. If rates were reduced, benefits would not necessarily flow to the states from which the contributions came, but, under the Telecom Act,<sup>59</sup> would produce nationwide toll rate decreases.

This plan does not provide any revenue for carriers providing services in the interstate jurisdiction. If the FCC is concerned that access charges include implicit subsidies, it may want to establish additional surcharges and distributions in order to convert existing implicit subsidies in the interstate jurisdiction to explicit subsidies.

### **B. Sufficiency**

Assuming that the national average cost is "reasonably comparable" to urban costs,<sup>60</sup> this proposal, in conjunction with state-raised funds, would be sufficient to ensure that all rural areas have intrastate rates no higher than those "reasonably comparable" to the average rates in urban areas nationally.

This plan may require states to enact supplemental programs, as authorized under Section 254(f) of the Telecom Act. The details will depend upon several factors, including whether states de-average their retail and wholesale rates.

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59. 47 U.S.C. §254(g).

60. Alternatively, in the case of embedded costs, assuming that 105% of the national average is reasonably comparable to urban costs.

### **C. Minimal Size**

The total cost of this proposal, is estimated at \$1.83 billion.<sup>61</sup> This is an increase from the current total support (for high cost and DEM weighting) of approximately \$1.25 billion.<sup>62</sup>

This proposal would require a smaller fund than any plan that fully funds the results of a forward-looking cost model. Since those models generally calculate support on a wire-center-by-wire-center basis (or smaller), and since they do not take account of embedded costs in low cost areas, they tend to require much larger expenditures of federal funds. For example, under the HAI Cost model, full federal funding would have a total cost of \$4.9 billion.<sup>63</sup>

### **D. Intrastate Revenues Unaffected**

This proposal would be financed by an explicit surcharge on the interstate revenues of interstate carriers. Intrastate revenues would not be affected.

### **E. Compatible with Competition**

#### **1. Competitively Neutral**

Federal funds would be distributed to state commissions, and the federal distribution would therefore be competitively neutral. In further distributing these funds, state commissions would also demonstrate, based on their plans approved by the FCC, that they would not establish a preference for a particular kind of carrier or technology.

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61. This estimate is based upon use of the HAI 5.0a Cost Model for forward-looking costs and full hold-harmless on DEM weighting for all companies, including average schedule companies. The data do not include the insular areas. Exclusion of DEM weighting for some average schedule companies should reduce this cost by approximately \$90 million.

62. 1996 high cost support was \$826 million, and DEM weighting was \$428 million. Industry Analysis Division, Common Carrier Bureau, FCC, *Universal Service Support and Telephone Revenue by State*, January, 1998 at Tables 2 and 6. These figures include Alaska and the insular areas.

63. This estimate does not include rural Alaska or the insular areas.

This plan calculates support without regard to whether a carrier is a "rural" or a "non-rural" carrier. Therefore the plan would no longer discriminate against customers served by large local exchange carriers.<sup>64</sup>

## **2. Supports Development of Competition**

A high cost plan should be compatible with the development of competition in the local exchange market. One important element in accomplishing this goal may be for state commissions to adopt aggressive pro-competition policies, and to rely upon forward-looking costs in setting unbundled network element costs.

For purposes of calculating high cost support, however, this plan utilizes the lesser of forward-looking and embedded costs. This is compatible with the development of competition in all areas. In particular, in areas where embedded cost is lower than forward-looking cost, this policy may be superior. For the reasons explained below, if support were distributed based only upon forward-looking cost, that support might not promote competition, and might even harm competition.

A competitive LEC will seek to provide service only if it expects to satisfy two conditions:

- (1) The competitor can provide service at prices that are competitive with the incumbent; and
- (2) The competitor's costs, prices and revenues will allow for a profit.

If USF support were distributed solely on a forward looking basis, the second test would be met. However, that is immaterial if the first condition can not be met.

USF at forward-looking costs will not help meet the first condition if a competitor's costs are higher than those of the incumbent. Since the incumbent's rates are usually based directly or indirectly on its embedded or sunk costs, a CLEC with higher costs will simply not be able to compete, absent an explicit subsidy.

However, providing equal support to the incumbent and to the CLEC will not change this, even if that support is based on forward-looking costs. The incumbent can simply apply support to

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64. Current FCC rules provide additional high cost support if a high cost company has fewer than 200,000 lines and to all companies with fewer than 50,000 lines.

reduce rates further to levels below actual cost, thus making it even harder for the incumbent to compete. Indeed, if the incumbent receives support in excess of embedded cost, it could actually inhibit competition before it starts, since it offers the incumbent an opportunity to build a "war chest" to fight its first competitor.

#### **F. Incentive for Investment**

Depending upon other factors, this plan offers many states the prospect of increased federal support soon after carriers in that state make additional investment in the existing network.<sup>65</sup> For these states, increased facilities investment will promptly result in increased support to the state, particularly since embedded cost data are used based upon projections rather than historical data.

#### **G. Compatible With Separations**

This plan takes account of the jurisdictional separations of costs and revenues. Support to states is reduced, by an average of approximately 25%, based upon costs already covered in the interstate jurisdiction. While ensuring adequate federal support, this mechanism prevents double recovery.

#### **H. Compatible with State Policies**

##### **1. State Distributions**

This plan distributes support to carriers in a manner directed by the state commission, although the hold-harmless portion of distributions would be constrained by the historical eligibility of carriers.

Discretionary distributions by state commissions would be constrained by a state distribution plan approved in advance by the FCC. State commissions would need to develop these plans. While this may be an added burden on states, it is one that will likely fall on states in any case if the existing FCC order is implemented.

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65. Under current calculations, 17 states would receive support based upon embedded cost.

State commissions would have significant discretion over the support distributed to individual carriers.<sup>66</sup> For this reason, state commissions will be able to coordinate federal high cost support with any supplemental state support. Indeed, several states already have high cost support mechanisms in place, and these states could be assured by this plan that federal funding distributions will not be incompatible with their existing programs.

State distribution of high cost funds may also make simpler any effort to tie support to service quality. State commissions are well situated to observe service quality in their states. If the FCC was able to provide periodic and comprehensive national data, state commissions might then choose to build incentives for service quality into their high cost distribution plans.

Distribution to state commissions will also minimize the effects of any residual errors in the forward looking cost models. First, because calculations will be made on a statewide basis rather than on a wire center basis (or smaller), errors arising from particular geographic circumstances will tend to disappear. By making the sample size larger, the models should be more accurate, at least as to some kinds of non-systematic errors. Second, under this plan relatively few states receive support based upon forward-looking cost. Therefore, for states receiving support on any other basis, any remaining errors in the forward-looking models cause no harm.

## **2. State Rate Designs**

Under the Telecom Act, states retain jurisdiction over intrastate rate designs, including whether to deaverage UNEs, whether to deaverage retail rates, and how to determine the size of service areas for ETCs. This plan will permit states to evolve all of these policies in an interrelated manner. No state would be required to establish a particular size unit for calculation of high cost support or for pricing.

### **I. Earnings Based on Market Success**

Because states will be able to coordinate high cost support policies with other competition policies (such as deaveraging of UNEs, deaveraging of retail services and the size of service areas) this plan is more likely to minimize the opportunity of carriers to make profits by exploiting the irregularities of state and federal regulatory policy.

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66. Hold-harmless support is an exception to this rule.

## **J. Cost-Based System**

This plan is based upon costs, rather than rates, and thus avoids any intrusion of uncontrollable variables, such as state decisions to allocate revenues between toll and local services. The plan takes account of the differences in average cost among states. Indeed, it uses that criterion as the chief basis for the distribution.

To the extent that a state chooses to deaverage rates, the plan could leave the state responsible to provide support for its own high cost areas from state-generated funds. This is appropriate given that states control important rate setting policies and the states are likely to differ considerably in the degree to which they deaverage rates and set the sizes of service areas assigned to competitive carriers. Federal support will ensure that even when states choose to levy supplemental charges to support high cost areas, they can still maintain overall rates that are reasonably comparable to rates in urban areas.

This plan uses embedded cost and forward-looking cost as independent limits on federal support. This ensures that the most economically efficient network is assumed when calculating high cost support. It also reduces the effect of any errors that may remain in forward-looking cost models.

## **K. Single System**

This plan combines the existing high cost program that applies to loop costs and the existing DEM weighting program that applies to switching costs. Several states appear to have either high loop costs or high switching costs, but not both. Since the statutory objective is reasonably comparable rates, and since rates are a function of all costs, combining loop and switching costs will produce a simpler solution than the existing dual programs.<sup>67</sup> This also is more efficient since it does not provide support to areas where loop or switching cost is high, but overall costs are moderate.

Combining loop, switch and trunking costs into a single plan is also consistent with the mechanisms underlying the forward-looking cost models. Those models estimate the cost characteristics of a network that can provide the services supported by universal service. That network necessarily includes some loop costs, but also some switching and trunking costs.

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67. This is consistent with the support calculations made by forward looking models, which generally calculate loop, switching and trunking costs.

This plan also creates a unified high cost system for the country as a whole, and thereby applies to areas served by "rural companies" and areas served by "non-rural companies." The plan does not consider a carrier's size (e.g., more than 50,000 lines or more than 200,000 lines), only the characteristics of the service territory. Therefore, this plan would allow the FCC to abolish the questionable distinction in the May 8 order between rural customers who happen to be served by "rural carriers" and rural customers who happen to be served by "non-rural carriers."

The FCC has stated that it will appoint a "Rural Task Force." If the present plan is adopted, the role of that task force can be refocused. Rather than dealing solely with areas served by "rural companies," the Task Force can focus on adopting proxy model methodologies that accurately reflect costs in all rural areas, whether served by large or small companies.

As mentioned above, this plan envisions a single system for all companies. However, if the FCC maintains its present policy and uses different timetables for implementing changes for rural and for non-rural companies, the plan can be modified to deal only with "non-rural companies."<sup>68</sup> Such a modification would not be desirable, however, because it is not entirely consistent with the principle that states with low average costs, overall, may be expected to support their own high cost areas through a state universal service plan.

For both of these reasons, combination of rural and non-rural and combination of loop, switch and trunking costs, the alternative plan is simpler to design and administer. In particular, this plan will permit the FCC to avoid the many difficult decisions and rulemakings that lie ahead regarding high cost support for rural telephone companies. By combining rural and non-rural, and by combining loop and switch, this plan considerably simplifies the existing issue structure. The FCC can avoid anticipated rulemakings, now planned for 2001 or after, relating to support for rural carriers. This will somewhat simplify the process of implementing the Telecom Act for the FCC, and, on a substantive policy level, it will end the troubling distinctions in present law between carriers based upon their overall size.

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68. If this plan were implemented only for non-rural companies, the distribution would utilize data reflecting average costs only in areas served by those non-rural companies. This would change the apparent state-wide average costs that are an input into this plan, and thus would change, for most states, the apparent ability of the state to support its own high cost areas. In addition, implementing the plan only for non-rural companies might require adjustment to some of the design factors in the plan, such as the percentage of national costs considered to be reasonably comparable to urban rates.

#### **L. Hold-harmless**

This plan includes hold-harmless protection, both for states as a whole and for individual companies. This increases the total cost of federal support. Nevertheless, it is generally consistent with the May 8 order, which promised rural telephone companies that they would not face any significant change in support levels until at least January 1, 2001.

Hold-harmless support should be appropriate until the FCC becomes convinced that the forward-looking cost models have become sufficiently precise that existing expectations of continued support can safely be set aside.

#### **M. Reduced Litigation Risk**

This proposal could greatly reduce the uncertainty arising from pending litigation in the Fifth Circuit of the United States Court of Appeals. In that court, at least one party is seeking to determine whether the FCC has authority to levy charges based on both the interstate and intrastate revenues of interstate carriers. In addition, certain high cost states are seeking a ruling on whether the FCC's May 8 order, setting federal support at 25% of need, is sufficient to ensure that rates in rural and high cost areas will be reasonably comparable to rates in urban areas.

If the pending challenge to the 25% federal support level should succeed in court, the stakes are high. If the Court should rule in favor of the petitioners and rule that the FCC must provide 100% of the support calculated under a forward-looking cost model, the HAI cost model would predict that the size of the federal fund might need to be \$4.9 billion, more than twice as large as the fund proposed here.

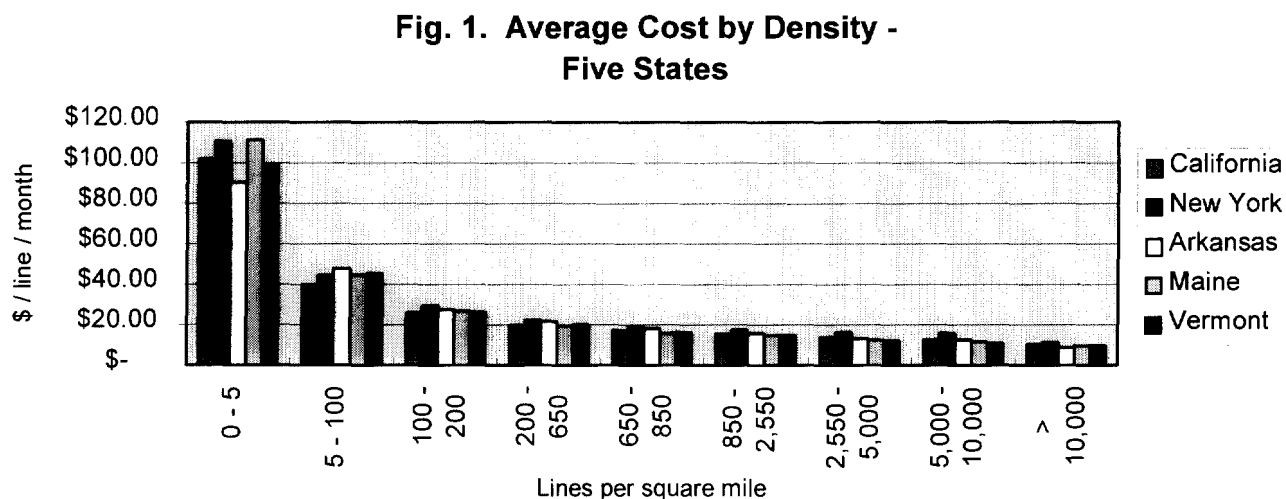
By adopting this plan, the FCC could moot both kinds of challenges. It would no longer be necessary for the FCC to assert jurisdiction to impose a charge on the intrastate revenues of interstate carriers, and issues arising from the 25% federal support level described in the May 8 order would be mooted. While subsequent litigation would of course still be possible, the probability of FCC success in such litigation might be higher than at present.



## Appendix A - The Distribution of Costs

Forward-looking cost models perform detailed cost analyses in small geographic areas. They then sort these geographic areas into zones based upon the density of telephone lines per square mile. It is possible then to examine how density affects cost.<sup>69</sup> The results clearly indicate that it is more expensive to provide telecommunications services in rural states than in more densely populated states.

Figure 1 shows, for five states, how forward-looking costs vary in the nine density zones used by the Hatfield model.



As Figure 1 illustrates, the Hatfield model predicts some cost variations from state to state, but comparatively larger variations from one density zone to another. For the most rural density zone (0 to 5 lines per square mile), costs are typically in the range of \$100 per line per month.<sup>70</sup> In the second density zone (5 to 100 lines per square mile), costs are in the range of \$40 to \$45 per

69. The following analysis is based upon the Hatfield model, version 3. No analysis has been performed using more recent versions of the model.

70. The Hatfield Model data used here was derived from the model author's run using standard design parameters. The five states shown are representative of urban and rural states. Nevertheless, costs in some states were higher or lower than the amounts shown here, particularly in the lowest density zone, from 0 to 5 lines per square mile.

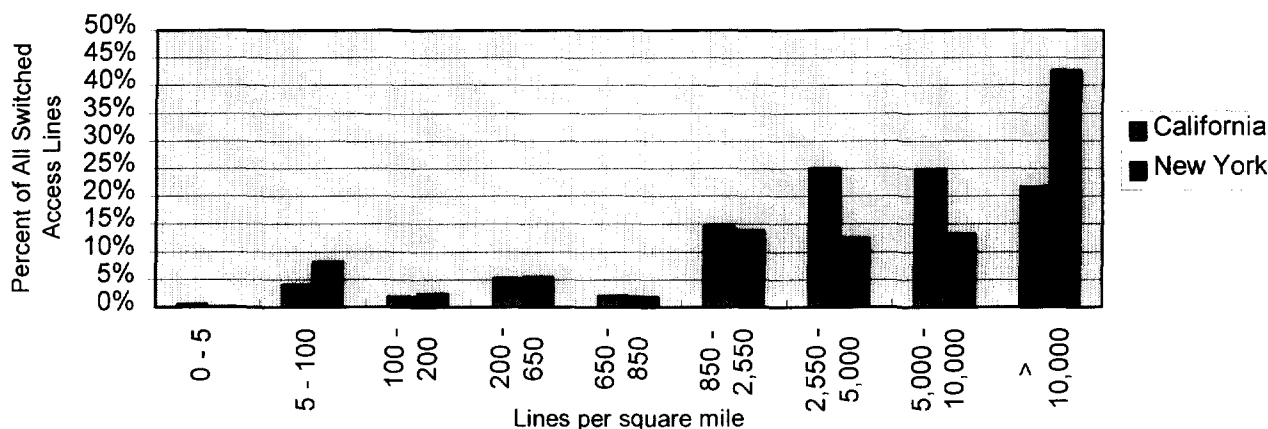
line per month. Conversely, in the three density zones where density exceeds 2,550 lines per square mile, costs average \$12.77 per month.

There is little uniformity from state to state, however, with regard to demographics. Figures 2 and 3 show the percentage of access lines found within each density zone for the same five states represented in Figure 1.

The two more urban states, California and New York, are represented in Figure 2. In California, 72% of the state's access lines are located in the three highest density zones. The Hatfield study reports the average weighted cost in these three zones in California to be \$12.19 per line per month. In New York, 68% of the access lines are found in those same three densely populated zones with an average cost of \$12.89 per line per month.

The combination of few high-cost lines and many low-cost lines within an urban state inevitably produces a low statewide average cost. Average costs predicted by the Hatfield model are \$15.01 in California and \$17.21 in New York. These states have lower statewide average costs than the national average cost of \$20.52.

**Fig. 2. Access Lines by Density -  
Two Low Cost States**



In rural states, settlement patterns are quite different. Figure 3 shows the corresponding data for Arkansas, Maine, and Vermont, three states that are more rural than either California or New York. The graph indicates that a greater percentage of access lines in these rural states are found in the lower density zones on the left side of the graph. Indeed, a significant portion of telephone customers in these states live in the second density zone (where density is between 5 to 100 lines

per square mile). The characteristic cost within this density zone is approximately \$45 per line per month.<sup>71</sup>

**Fig. 3. Access Lines by Density - Three High Cost States**

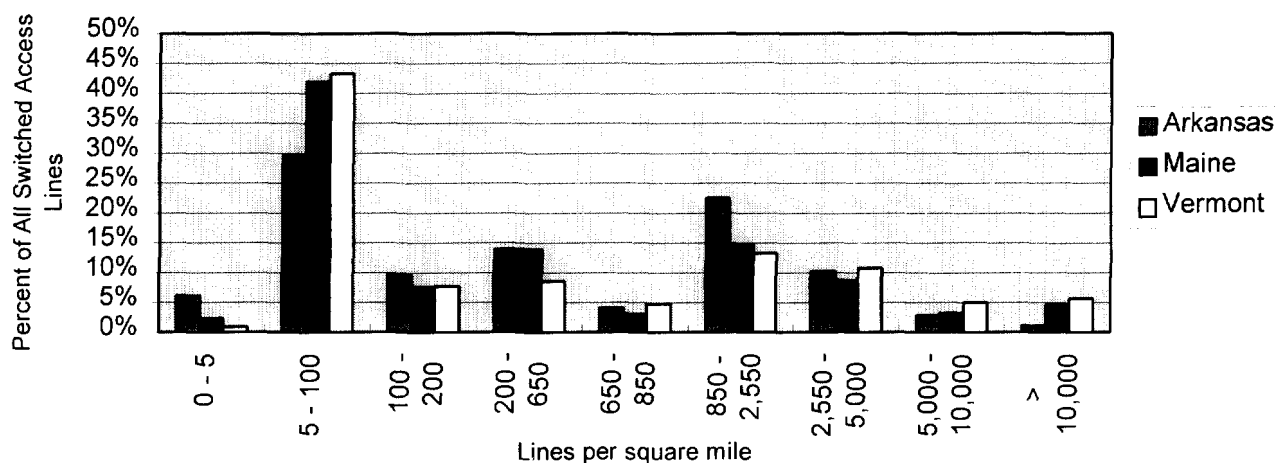


Figure 3 also shows that each of these three rural states has only a small proportion of its access lines located in the three highest density zones. Therefore these states have relatively few low-cost lines.

A state with a high percentage of its access lines in high cost areas generally will have a high average cost. Average costs predicted by the Hatfield model are \$31.43 in Arkansas, \$30.42 in Maine, and \$29.45 in Vermont. The statewide average in all three states is about \$10 higher than the national average cost.

Since a high proportion of access lines in these rural states are in low-density and high-cost areas, these states may also have a higher proportion of customers at risk from any rate de-averaging that might follow local exchange competition. While density is not the only determinant of high cost, this analysis demonstrates that some rural states have a high proportion of their access lines in high cost areas. These areas would be particularly vulnerable to rate increases, and the ensuing loss of customer penetration, if funding for high cost support is insufficient.

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71. Each of the three states also shows increased population in the fifth density zone. This presumably results from the effects of small cities, like Little Rock, Portland, and Burlington. The cost characteristic of this density zone is about \$15 per month.

## **Appendix B - Sources of Embedded Cost Data**

Embedded data were derived from the following sources.

(a) Loop Cost.

This was set equal to the 1996 unseparated NTS revenue requirement<sup>72</sup> of all carriers, as reported to the FCC and as further reported in the 1997 Monitoring Report prepared by the Docket 80-286 Joint Board staff.

(b) Switching Cost.

(i) For Cost Companies - Data were extracted from the same NECA filing that was used for the loop studies. Contained in this data is Account 2210, Central Office Equipment (COE) Switching Investment which was used to determine Cat 2 (Tandem) and Cat 3 (Local Switching) by cost company study area. Using ARMIS 4304 data, GSF factors were calculated to supplement the COE data. Generic "small company" factors were developed using the average of all Tier 1 LECs excluding the RBOCs. Individual factors were developed at the study area level for the Tier 1 LECs. The revenue requirements were divided by USF loops to obtain a Switching Revenue Requirements/Loop, by study area.

(ii) For Average Schedule Companies - The data of local switching support (weighted DEM) amounts by study area was obtained from a filing with USAC. This data was generated by multiplying the COE revenue requirements by a set of factors based upon line size and minutes of use per line. The factors used are a part of the USAC filing. The COE revenue requirements were obtained by dividing local switching support (weighted DEM) by the factors described above. Using the "small company" GSF factors developed above, the GSF amounts were added to the direct cost. The revenue requirements were divided by USF loops to obtain a Switching Revenue Requirement/Loop, by study area.

(c) Trunking Cost.

VI. Total Cable & Wire (C&W) Investments and Expenses and Total COE Transmission Investments and Expenses by cost company were extracted from the NECA data. Using ARMIS data, a factor was developed for message trunk investment to total investment for both COE - Transmission and C&W. This factor approximates the effect of the removal of loop investment (both message and private line), and private line trunk investment. The ratio is unique for each Tier 1 study area. Study area trunking revenue requirements were then developed. The revenue

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72. 47 C.F.R. § 36.621

requirements were divided by USF loops to obtain a Trunking Revenue Requirement/Loop, by study area.

**High Cost Modeling Project  
New Support Summary**

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Step 1: Calculate 75% of excess forward looking cost above stated threshold.  
Step 2: Calculate 75% of excess embedded cost above stated threshold.  
Step 3: Calculate the lesser of results 1 and 2.  
Step 4: Calculate Hold-harmless payments (see later sheets for explanation)  
Step 5: Federal support equals greater of results 3 and 4

	Federal Support to Intrastate Jurisdiction										Result: Support for State Determined by which Formula?
	Step 1: Calculate Forward- Looking Support		Step 2: Calculate Embedded Cost Support		Step 3: Lesser of Steps 1 and 2		Step 4: Hold Harmless		Step 5: Greater of Steps 3 & 4		
	Threshold= 100% or = \$ 19.67		Threshold= 106% or = \$ 35.68								
	per line per mo.	Annual Total	per line per mo.	Annual Total	per line per mo.	Annual Total	per line per mo.	Annual Total	per line per mo.	Annual Total	
	(\$ / l / mo)	(\$ millions)	(\$ / l / mo)	(\$ millions)	(\$ / l / mo)	(\$ millions)	(\$ / l / mo)	(\$ millions)	(\$ / l / mo)	(\$ millions)	
Alaska /1	\$ 11.60	\$ 53	\$ 11.60	\$ 53	\$ 11.60	\$ 53	\$ 9.09	\$ 41	\$ 11.60	\$ 53	Forward-Looking
Alabama	\$ 6.01	\$ 167	\$ 0.49	\$ 14	\$ 0.49	\$ 14	\$ 1.18	\$ 33	\$ 1.18	\$ 33	Hold-Harmless
Arizona	\$ -	\$ -	\$ 0.79	\$ 24	\$ -	\$ -	\$ 1.34	\$ 41	\$ 1.34	\$ 41	Hold-Harmless
Arkansas	\$ 8.24	\$ 130	\$ 6.29	\$ 99	\$ 6.29	\$ 99	\$ 3.52	\$ 56	\$ 6.29	\$ 99	Embedded
California	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.15	\$ 38	\$ 0.15	\$ 38	Hold-Harmless
Colorado	\$ 1.99	\$ 59	\$ 3.29	\$ 97	\$ 1.99	\$ 59	\$ 1.14	\$ 34	\$ 1.99	\$ 59	Forward-Looking
Connecticut	\$ -	\$ -	\$ 0.63	\$ 15	\$ -	\$ -	\$ 0.52	\$ 13	\$ 0.52	\$ 13	Hold-Harmless
Delaware	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
District of Columbia	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Florida	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.50	\$ 59	\$ 0.50	\$ 59	Hold-Harmless
Georgia	\$ 1.47	\$ 80	\$ 2.77	\$ 150	\$ 1.47	\$ 80	\$ 1.01	\$ 55	\$ 1.47	\$ 80	Forward-Looking
Hawaii	\$ -	\$ -	\$ 4.03	\$ 34	\$ -	\$ -	\$ 0.39	\$ 3	\$ 0.39	\$ 3	Hold-Harmless
Idaho	\$ 7.88	\$ 61	\$ 3.54	\$ 27	\$ 3.54	\$ 27	\$ 3.43	\$ 26	\$ 3.54	\$ 27	Embedded
Illinois	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.18	\$ 16	\$ 0.18	\$ 16	Hold-Harmless
Indiana	\$ 0.80	\$ 32	\$ -	\$ -	\$ -	\$ -	\$ 0.29	\$ 11	\$ 0.29	\$ 11	Hold-Harmless
Iowa	\$ 7.01	\$ 130	\$ -	\$ -	\$ -	\$ -	\$ 1.09	\$ 20	\$ 1.09	\$ 20	Hold-Harmless
Kansas	\$ 7.17	\$ 131	\$ 3.31	\$ 60	\$ 3.31	\$ 60	\$ 2.65	\$ 48	\$ 3.31	\$ 60	Embedded
Kentucky	\$ 4.51	\$ 107	\$ 3.04	\$ 72	\$ 3.04	\$ 72	\$ 0.85	\$ 20	\$ 3.04	\$ 72	Embedded
Louisiana	\$ 1.72	\$ 48	\$ 3.12	\$ 88	\$ 1.72	\$ 48	\$ 1.79	\$ 50	\$ 1.79	\$ 50	Hold-Harmless
Maine	\$ 7.27	\$ 68	\$ 5.42	\$ 50	\$ 5.42	\$ 50	\$ 1.19	\$ 11	\$ 5.42	\$ 50	Embedded
Maryland	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.01	\$ 0	\$ 0.01	\$ 0	Hold-Harmless
Massachusetts	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.01	\$ 0	\$ 0.01	\$ 0	Hold-Harmless
Michigan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.35	\$ 25	\$ 0.35	\$ 25	Hold-Harmless
Minnesota	\$ 3.92	\$ 131	\$ -	\$ -	\$ -	\$ -	\$ 0.78	\$ 26	\$ 0.78	\$ 26	Hold-Harmless
Mississippi	\$ 9.60	\$ 146	\$ 7.00	\$ 107	\$ 7.00	\$ 107	\$ 1.53	\$ 23	\$ 7.00	\$ 107	Embedded
Missouri	\$ 3.92	\$ 150	\$ 0.65	\$ 25	\$ 0.65	\$ 25	\$ 1.03	\$ 40	\$ 1.03	\$ 40	Hold-Harmless
Montana	\$ 25.09	\$ 147	\$ 7.89	\$ 46	\$ 7.89	\$ 46	\$ 5.81	\$ 34	\$ 7.89	\$ 46	Embedded
Nebraska	\$ 12.26	\$ 141	\$ 3.03	\$ 35	\$ 3.03	\$ 35	\$ 1.39	\$ 16	\$ 3.03	\$ 35	Embedded
Nevada	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.59	\$ 8	\$ 0.59	\$ 8	Hold-Harmless
New Hampshire	\$ 1.74	\$ 16	\$ 3.25	\$ 30	\$ 1.74	\$ 16	\$ 0.80	\$ 7	\$ 1.74	\$ 16	Forward-Looking
New Jersey	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.05	\$ 3	\$ 0.05	\$ 3	Hold-Harmless
New Mexico	\$ 8.65	\$ 90	\$ 5.12	\$ 53	\$ 5.12	\$ 53	\$ 2.85	\$ 30	\$ 5.12	\$ 53	Embedded
New York	\$ -	\$ -	\$ 1.49	\$ 220	\$ -	\$ -	\$ 0.51	\$ 76	\$ 0.51	\$ 76	Hold-Harmless
North Carolina	\$ 3.53	\$ 189	\$ 1.39	\$ 74	\$ 1.39	\$ 74	\$ 0.53	\$ 28	\$ 1.39	\$ 74	Embedded
North Dakota	\$ 25.25	\$ 119	\$ 2.42	\$ 11	\$ 2.42	\$ 11	\$ 3.38	\$ 16	\$ 3.38	\$ 16	Hold-Harmless
Ohio	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.12	\$ 10	\$ 0.12	\$ 10	Hold-Harmless
Oklahoma	\$ 6.57	\$ 147	\$ 1.98	\$ 44	\$ 1.98	\$ 44	\$ 1.98	\$ 44	\$ 1.98	\$ 44	Hold-Harmless
Oregon	\$ 2.35	\$ 54	\$ 1.54	\$ 35	\$ 1.54	\$ 35	\$ 1.16	\$ 27	\$ 1.54	\$ 35	Embedded
Pennsylvania	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.12	\$ 11	\$ 0.12	\$ 11	Hold-Harmless
Rhode Island	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
South Carolina	\$ 2.94	\$ 72	\$ 4.33	\$ 106	\$ 2.94	\$ 72	\$ 1.47	\$ 36	\$ 2.94	\$ 72	Forward-Looking
South Dakota	\$ 24.26	\$ 115	\$ 2.94	\$ 14	\$ 2.94	\$ 14	\$ 2.64	\$ 13	\$ 2.94	\$ 14	Embedded
Tennessee	\$ 2.79	\$ 106	\$ -	\$ -	\$ -	\$ -	\$ 0.82	\$ 31	\$ 0.82	\$ 31	Hold-Harmless
Texas	\$ 0.31	\$ 41	\$ 1.06	\$ 144	\$ 0.31	\$ 41	\$ 0.92	\$ 125	\$ 0.92	\$ 125	Hold-Harmless
Utah	\$ 1.23	\$ 15	\$ -	\$ -	\$ -	\$ -	\$ 1.03	\$ 13	\$ 1.03	\$ 13	Hold-Harmless
Vermont	\$ 6.36	\$ 29	\$ 9.53	\$ 43	\$ 6.36	\$ 29	\$ 1.89	\$ 9	\$ 6.36	\$ 29	Forward-Looking
Virginia	\$ 0.35	\$ 18	\$ -	\$ -	\$ -	\$ -	\$ 0.20	\$ 10	\$ 0.20	\$ 10	Hold-Harmless
Washington	\$ -	\$ -	\$ 0.66	\$ 27	\$ -	\$ -	\$ 1.11	\$ 44	\$ 1.11	\$ 44	Hold-Harmless
West Virginia	\$ 10.02	\$ 112	\$ 5.09	\$ 57	\$ 5.09	\$ 57	\$ 1.81	\$ 20	\$ 5.09	\$ 57	Embedded
Wisconsin	\$ 1.74	\$ 66	\$ -	\$ -	\$ -	\$ -	\$ 0.99	\$ 38	\$ 0.99	\$ 38	Hold-Harmless
Wyoming	\$ 15.05	\$ 49	\$ 10.23	\$ 33	\$ 10.23	\$ 33	\$ 5.15	\$ 17	\$ 10.23	\$ 33	Embedded
Total		\$ 2,966		\$ 1,836		\$ 1,204		\$ 1,315		\$ 1,826	
Maximum Value	\$ 25.25		\$ 10.23		\$ 10.23		\$ 5.81		\$ 10.23	(note 1)	
Minimum Value	\$ -		\$ -		\$ -		\$ -		\$ -		

Number of states under:	
- Forward-Looking Cost	5
- Embedded Cost	14
- Hold-Harmless	28
- No Support	3

Federal Rate Required:	2.2165%
System Out of Balance by:	\$ 0.01 million

Note 1: The totals shown here are probably overestimated, because DEM Weighting hold-harmless here includes 100% of past support for all average schedule companies.

**High Cost Modeling Project**  
**Hold-Harmless Calculation - Part A**

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	Type A Hold-Harmless (Support Based)			Type B Hold Harmless (Contrib- ution Based)	Hold- Harmless Support (Step 4)
	Existing Support		Type A Hold- Harmless		
	High Cost Support	DEM Weighting (note 1)			
	(millions)	(millions)			
Alaska	\$ 28.6	\$ 12.5	\$ 41.2	\$ -	\$ 41.2
Alabama	\$ 21.8	\$ 11.0	\$ 32.8	\$ -	\$ 32.8
Arizona	\$ 19.3	\$ 6.5	\$ 25.8	\$ 15.0	\$ 40.8
Arkansas	\$ 46.2	\$ 9.5	\$ 55.7	\$ -	\$ 55.7
California	\$ 28.8	\$ 9.2	\$ 38.0	\$ -	\$ 38.0
Colorado	\$ 29.2	\$ 4.3	\$ 33.5	\$ -	\$ 33.5
Connecticut	\$ -	\$ 1.2	\$ 1.2	\$ 11.3	\$ 12.5
Delaware	\$ -	\$ -	\$ -	\$ -	\$ -
District of Columbia	\$ -	\$ -	\$ -	\$ -	\$ -
Florida	\$ 12.3	\$ 5.9	\$ 18.1	\$ 40.8	\$ 58.9
Georgia	\$ 41.8	\$ 12.8	\$ 54.6	\$ -	\$ 54.6
Hawaii	\$ -	\$ 0.6	\$ 0.6	\$ 2.6	\$ 3.2
Idaho	\$ 19.5	\$ 6.9	\$ 26.4	\$ -	\$ 26.4
Illinois	\$ 5.5	\$ 10.8	\$ 16.3	\$ -	\$ 16.3
Indiana	\$ 2.9	\$ 8.5	\$ 11.5	\$ -	\$ 11.5
Iowa	\$ 4.4	\$ 15.7	\$ 20.1	\$ -	\$ 20.1
Kansas	\$ 36.3	\$ 12.2	\$ 48.5	\$ -	\$ 48.5
Kentucky	\$ 14.3	\$ 6.1	\$ 20.3	\$ -	\$ 20.3
Louisiana	\$ 42.0	\$ 8.2	\$ 50.2	\$ -	\$ 50.2
Maine	\$ 4.8	\$ 6.3	\$ 11.0	\$ -	\$ 11.0
Maryland	\$ -	\$ 0.5	\$ 0.5	\$ -	\$ 0.5
Massachusetts	\$ 0.0	\$ 0.3	\$ 0.3	\$ -	\$ 0.3
Michigan	\$ 13.9	\$ 11.3	\$ 25.2	\$ -	\$ 25.2
Minnesota	\$ 8.1	\$ 18.0	\$ 26.1	\$ -	\$ 26.1
Mississippi	\$ 18.4	\$ 4.9	\$ 23.3	\$ -	\$ 23.3
Missouri	\$ 29.7	\$ 10.0	\$ 39.6	\$ -	\$ 39.6
Montana	\$ 23.8	\$ 10.3	\$ 34.0	\$ -	\$ 34.0
Nebraska	\$ 6.1	\$ 9.9	\$ 16.0	\$ -	\$ 16.0
Nevada	\$ 3.3	\$ 4.6	\$ 7.9	\$ -	\$ 7.9
New Hampshire	\$ 2.6	\$ 4.8	\$ 7.4	\$ -	\$ 7.4
New Jersey	\$ 2.1	\$ 1.2	\$ 3.3	\$ -	\$ 3.3
New Mexico	\$ 19.4	\$ 10.1	\$ 29.6	\$ -	\$ 29.6
New York	\$ 9.9	\$ 20.9	\$ 30.8	\$ 45.1	\$ 75.9
North Carolina	\$ 21.9	\$ 6.3	\$ 28.2	\$ -	\$ 28.2
North Dakota	\$ 4.7	\$ 11.3	\$ 16.0	\$ -	\$ 16.0
Ohio	\$ 4.5	\$ 5.1	\$ 9.6	\$ -	\$ 9.6
Oklahoma	\$ 27.2	\$ 17.2	\$ 44.3	\$ -	\$ 44.3
Oregon	\$ 18.5	\$ 8.2	\$ 26.6	\$ -	\$ 26.6
Pennsylvania	\$ 1.4	\$ 10.0	\$ 11.4	\$ -	\$ 11.4
Rhode Island	\$ -	\$ -	\$ -	\$ -	\$ -
South Carolina	\$ 23.3	\$ 12.7	\$ 36.0	\$ -	\$ 36.0
South Dakota	\$ 2.8	\$ 9.7	\$ 12.5	\$ -	\$ 12.5
Tennessee	\$ 8.1	\$ 11.4	\$ 19.5	\$ 11.7	\$ 31.2
Texas	\$ 77.0	\$ 19.3	\$ 96.3	\$ 28.7	\$ 125.0
Utah	\$ 2.9	\$ 4.5	\$ 7.5	\$ 5.2	\$ 12.7
Vermont	\$ 3.7	\$ 4.9	\$ 8.6	\$ -	\$ 8.6
Virginia	\$ 4.8	\$ 5.4	\$ 10.2	\$ -	\$ 10.2
Washington	\$ 23.1	\$ 7.6	\$ 30.6	\$ 13.8	\$ 44.4
West Virginia	\$ 17.0	\$ 3.2	\$ 20.2	\$ -	\$ 20.2
Wisconsin	\$ 13.0	\$ 24.8	\$ 37.8	\$ -	\$ 37.8
Wyoming	\$ 12.7	\$ 4.1	\$ 16.9	\$ -	\$ 16.9
Total	\$ 733	\$ 408	\$ 1,141	\$ 174	\$ 1,315

Note 1: DEM weighting amounts shown here include all average schedule companies, and thus overestimate support.

**High Cost Modeling Project  
Hold-Harmless Calculation - Part B**

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	Type B Hold-Harmless - Contribution Based								Check Sum	Interstate Revenues
	New System With Type A Hold- Harmless Included			Existing System Net Pay-In (if > 0) (millions)	Increased Net Pay-In (if > 0) (millions)	Embedded Costs		Type B Hold Harmless Support (millions)		
						Percent of National Average	Switch : Thres- hold = 100% of N/Avg (On = 1)			
	Support (millions)	Contrib- ution (millions)	Net Pay-In (if > 0) (millions)							
Alaska	\$ 52.6	\$ 4.4	\$ -	\$ -	\$ -	151%	1	\$ -		
Alabama	\$ 32.8	\$ 22.5	\$ -	\$ -	\$ -	107%	1	\$ -		
Arizona	\$ 25.8	\$ 32.3	\$ 6.6	\$ -	\$ 6.6	108%	1	\$ 15.0	(0.0)	1,613.4
Arkansas	\$ 99.5	\$ 13.6	\$ -	\$ -	\$ -	130%	1	\$ -		
California	\$ 38.0	\$ 160.1	\$ 122.1	\$ 105.6	\$ 16.5	85%	0	\$ -		
Colorado	\$ 58.5	\$ 31.9	\$ -	\$ -	\$ -	118%	1	\$ -		
Connecticut	\$ 1.2	\$ 26.4	\$ 25.2	\$ 16.7	\$ 8.5	107%	1	\$ 11.3	0.0	1,317
Delaware	\$ -	\$ 6.4	\$ 6.4	\$ 4.2	\$ 2.2	78%	0	\$ -		
District of Columbia	\$ -	\$ 9.5	\$ 9.5	\$ 6.8	\$ 2.6	58%	0	\$ -		
Florida	\$ 18.1	\$ 107.3	\$ 89.2	\$ 59.7	\$ 29.5	103%	1	\$ 40.8	(0.0)	5,356
Georgia	\$ 79.7	\$ 54.4	\$ -	\$ -	\$ -	116%	1	\$ -		
Hawaii	\$ 0.6	\$ 6.8	\$ 6.2	\$ 4.3	\$ 1.9	121%	1	\$ 2.6	(0.0)	342
Idaho	\$ 27.3	\$ 8.4	\$ -	\$ -	\$ -	119%	1	\$ -		
Illinois	\$ 16.3	\$ 69.8	\$ 53.5	\$ 41.2	\$ 12.3	83%	0	\$ -		
Indiana	\$ 11.5	\$ 30.2	\$ 18.7	\$ 12.8	\$ 5.9	94%	0	\$ -		
Iowa	\$ 20.1	\$ 16.1	\$ -	\$ -	\$ -	101%	1	\$ -		
Kansas	\$ 60.4	\$ 16.1	\$ -	\$ -	\$ -	118%	1	\$ -		
Kentucky	\$ 72.5	\$ 22.8	\$ -	\$ -	\$ -	117%	1	\$ -		
Louisiana	\$ 50.2	\$ 22.4	\$ -	\$ -	\$ -	117%	1	\$ -		
Maine	\$ 50.5	\$ 8.0	\$ -	\$ -	\$ -	126%	1	\$ -		
Maryland	\$ 0.5	\$ 36.9	\$ 36.4	\$ 25.2	\$ 11.2	87%	0	\$ -		
Massachusetts	\$ 0.3	\$ 43.7	\$ 43.4	\$ 33.4	\$ 10.0	97%	0	\$ -		
Michigan	\$ 25.2	\$ 45.4	\$ 20.3	\$ 16.2	\$ 4.1	89%	0	\$ -		
Minnesota	\$ 26.1	\$ 27.6	\$ 1.5	\$ -	\$ 1.5	97%	0	\$ -		
Mississippi	\$ 106.7	\$ 13.6	\$ -	\$ -	\$ -	133%	1	\$ -		
Missouri	\$ 39.6	\$ 30.9	\$ -	\$ -	\$ -	108%	1	\$ -		
Montana	\$ 46.2	\$ 6.1	\$ -	\$ -	\$ -	136%	1	\$ -		
Nebraska	\$ 34.9	\$ 10.4	\$ -	\$ -	\$ -	117%	1	\$ -		
Nevada	\$ 7.9	\$ 15.7	\$ 7.7	\$ 1.3	\$ 6.4	82%	0	\$ -		
New Hampshire	\$ 16.1	\$ 11.1	\$ -	\$ -	\$ -	118%	1	\$ -		
New Jersey	\$ 3.3	\$ 73.4	\$ 70.1	\$ 46.5	\$ 23.6	81%	0	\$ -		
New Mexico	\$ 53.0	\$ 11.6	\$ -	\$ -	\$ -	125%	1	\$ -		
New York	\$ 30.8	\$ 125.5	\$ 94.7	\$ 62.9	\$ 31.8	111%	1	\$ 45.1	0.0	6,263
North Carolina	\$ 74.1	\$ 46.0	\$ -	\$ 4.7	\$ (4.7)	110%	1	\$ -		
North Dakota	\$ 16.0	\$ 5.2	\$ -	\$ -	\$ -	115%	1	\$ -		
Ohio	\$ 9.6	\$ 61.5	\$ 51.9	\$ 37.0	\$ 14.8	95%	0	\$ -		
Oklahoma	\$ 44.3	\$ 18.2	\$ -	\$ -	\$ -	113%	1	\$ -		
Oregon	\$ 35.3	\$ 21.2	\$ -	\$ -	\$ -	111%	1	\$ -		
Pennsylvania	\$ 11.4	\$ 73.4	\$ 61.9	\$ 44.1	\$ 17.8	84%	0	\$ -		
Rhode Island	\$ -	\$ 7.4	\$ 7.4	\$ 5.1	\$ 2.2	97%	0	\$ -		
South Carolina	\$ 72.0	\$ 23.0	\$ -	\$ -	\$ -	122%	1	\$ -		
South Dakota	\$ 13.9	\$ 5.2	\$ -	\$ -	\$ -	117%	1	\$ -		
Tennessee	\$ 19.5	\$ 32.7	\$ 13.3	\$ 5.0	\$ 8.3	105%	1	\$ 11.7	(0.0)	1,633
Texas	\$ 96.3	\$ 98.0	\$ 1.7	\$ -	\$ 1.7	109%	1	\$ 28.7	0.0	4,891
Utah	\$ 7.5	\$ 12.2	\$ 4.7	\$ 0.8	\$ 3.9	101%	1	\$ 5.2	0.0	607
Vermont	\$ 29.0	\$ 5.2	\$ -	\$ -	\$ -	142%	1	\$ -		
Virginia	\$ 10.2	\$ 48.3	\$ 38.0	\$ 22.4	\$ 15.6	93%	0	\$ -		
Washington	\$ 30.6	\$ 36.4	\$ 5.8	\$ -	\$ 5.8	108%	1	\$ 13.8	(0.0)	1,816
West Virginia	\$ 56.9	\$ 9.9	\$ -	\$ -	\$ -	125%	1	\$ -		
Wisconsin	\$ 37.8	\$ 26.6	\$ -	\$ -	\$ -	88%	0	\$ -		
Wyoming	\$ 33.5	\$ 4.0	\$ -	\$ -	\$ -	145%	1	\$ -		
Total	\$ 1,652	\$ 1,652	\$ 796	\$ 556	\$ 240		34	\$ 174	(0.0)	23,838

82,416

29%



**High Cost Modeling Project  
Summary of Existing System Net Benefits**

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	Contributions Under Current System V1			Support Under Current System			Net Benefit
	High Cost Fund (000s)	DEM Weighting (000s)	Total (000s)	High Cost Fund (000s)	DEM Weighting (000s)	Total (000s)	Total (000s)
Alaska	\$ 1,848	\$ 1,140	\$ 2,989	\$ 28,649	\$ 12,520	\$ 41,169	\$ 38,180
Alabama	\$ 11,621	\$ 5,747	\$ 17,368	\$ 21,772	\$ 11,044	\$ 32,816	\$ 15,448
Arizona	\$ 12,564	\$ 8,165	\$ 20,729	\$ 19,284	\$ 6,478	\$ 25,763	\$ 5,033
Arkansas	\$ 6,704	\$ 3,477	\$ 10,182	\$ 46,203	\$ 9,542	\$ 55,745	\$ 45,563
California	\$ 103,056	\$ 40,526	\$ 143,582	\$ 28,822	\$ 9,195	\$ 38,017	\$ (105,565)
Colorado	\$ 12,390	\$ 8,400	\$ 20,791	\$ 29,211	\$ 4,301	\$ 33,513	\$ 12,722
Connecticut	\$ 10,592	\$ 7,299	\$ 17,891	\$ -	\$ 1,229	\$ 1,229	\$ (16,661)
Delaware	\$ 2,427	\$ 1,803	\$ 4,230	\$ -	\$ -	\$ -	\$ (4,230)
District of Columbia	\$ 4,015	\$ 2,805	\$ 6,820	\$ -	\$ -	\$ -	\$ (6,820)
Florida	\$ 49,805	\$ 28,013	\$ 77,817	\$ 12,263	\$ 5,853	\$ 18,116	\$ (59,702)
Georgia	\$ 22,247	\$ 13,222	\$ 35,469	\$ 41,814	\$ 12,822	\$ 54,636	\$ 19,168
Hawaii	\$ 3,202	\$ 1,749	\$ 4,951	\$ -	\$ 645	\$ 645	\$ (4,306)
Idaho	\$ 3,188	\$ 2,140	\$ 5,329	\$ 19,502	\$ 6,904	\$ 26,406	\$ 21,078
Illinois	\$ 38,727	\$ 18,796	\$ 57,523	\$ 5,513	\$ 10,806	\$ 16,318	\$ (41,205)
Indiana	\$ 16,246	\$ 8,033	\$ 24,279	\$ 2,917	\$ 8,550	\$ 11,467	\$ (12,813)
Iowa	\$ 7,781	\$ 4,253	\$ 12,033	\$ 4,404	\$ 15,650	\$ 20,054	\$ 8,021
Kansas	\$ 7,734	\$ 4,038	\$ 11,772	\$ 36,274	\$ 12,186	\$ 48,461	\$ 36,688
Kentucky	\$ 9,874	\$ 4,998	\$ 14,872	\$ 14,274	\$ 6,070	\$ 20,345	\$ 5,472
Louisiana	\$ 11,790	\$ 5,656	\$ 17,446	\$ 41,966	\$ 8,228	\$ 50,194	\$ 32,748
Maine	\$ 3,928	\$ 1,999	\$ 5,927	\$ 4,765	\$ 6,276	\$ 11,041	\$ 5,114
Maryland	\$ 15,881	\$ 9,831	\$ 25,712	\$ -	\$ 498	\$ 498	\$ (25,214)
Massachusetts	\$ 21,604	\$ 12,170	\$ 33,774	\$ 7	\$ 332	\$ 339	\$ (33,435)
Michigan	\$ 29,675	\$ 11,670	\$ 41,345	\$ 13,924	\$ 11,259	\$ 25,182	\$ (16,163)
Minnesota	\$ 14,203	\$ 6,673	\$ 20,877	\$ 8,131	\$ 17,992	\$ 26,124	\$ 5,247
Mississippi	\$ 6,477	\$ 3,569	\$ 10,046	\$ 18,404	\$ 4,913	\$ 23,317	\$ 13,270
Missouri	\$ 15,944	\$ 8,039	\$ 23,983	\$ 29,681	\$ 9,967	\$ 39,648	\$ 15,664
Montana	\$ 2,506	\$ 1,606	\$ 4,112	\$ 23,760	\$ 10,287	\$ 34,048	\$ 29,936
Nebraska	\$ 4,828	\$ 2,639	\$ 7,467	\$ 6,124	\$ 9,882	\$ 16,005	\$ 8,538
Nevada	\$ 5,589	\$ 3,674	\$ 9,263	\$ 3,291	\$ 4,625	\$ 7,916	\$ (1,347)
New Hampshire	\$ 3,917	\$ 2,897	\$ 6,814	\$ 2,571	\$ 4,839	\$ 7,409	\$ 595
New Jersey	\$ 30,058	\$ 19,682	\$ 49,740	\$ 2,129	\$ 1,153	\$ 3,282	\$ (46,458)
New Mexico	\$ 4,236	\$ 2,908	\$ 7,145	\$ 19,438	\$ 10,119	\$ 29,557	\$ 22,412
New York	\$ 60,164	\$ 33,525	\$ 93,689	\$ 9,913	\$ 20,897	\$ 30,809	\$ (62,880)
North Carolina	\$ 21,681	\$ 11,214	\$ 32,895	\$ 21,925	\$ 6,308	\$ 28,233	\$ (4,661)
North Dakota	\$ 1,843	\$ 1,094	\$ 2,938	\$ 4,652	\$ 11,317	\$ 15,969	\$ 13,031
Ohio	\$ 32,405	\$ 14,267	\$ 46,672	\$ 4,506	\$ 5,138	\$ 9,644	\$ (37,028)
Oklahoma	\$ 9,485	\$ 4,821	\$ 14,306	\$ 27,165	\$ 17,182	\$ 44,347	\$ 30,041
Oregon	\$ 9,612	\$ 6,100	\$ 15,712	\$ 18,454	\$ 8,152	\$ 26,606	\$ 10,894
Pennsylvania	\$ 37,047	\$ 18,531	\$ 55,578	\$ 1,417	\$ 10,012	\$ 11,429	\$ (44,149)
Rhode Island	\$ 3,134	\$ 2,004	\$ 5,138	\$ -	\$ -	\$ -	\$ (5,138)
South Carolina	\$ 10,209	\$ 5,848	\$ 16,057	\$ 23,333	\$ 12,654	\$ 35,988	\$ 19,931
South Dakota	\$ 2,004	\$ 1,251	\$ 3,254	\$ 2,809	\$ 9,723	\$ 12,533	\$ 9,278
Tennessee	\$ 15,984	\$ 8,471	\$ 24,455	\$ 8,093	\$ 11,380	\$ 19,474	\$ (4,981)
Texas	\$ 55,565	\$ 24,144	\$ 79,709	\$ 76,977	\$ 19,307	\$ 96,284	\$ 16,575
Utah	\$ 5,123	\$ 3,132	\$ 8,255	\$ 2,906	\$ 4,547	\$ 7,453	\$ (803)
Vermont	\$ 1,902	\$ 1,350	\$ 3,251	\$ 3,739	\$ 4,880	\$ 8,618	\$ 5,367
Virginia	\$ 19,593	\$ 13,066	\$ 32,658	\$ 4,823	\$ 5,419	\$ 10,242	\$ (22,417)
Washington	\$ 17,016	\$ 9,406	\$ 26,422	\$ 23,076	\$ 7,570	\$ 30,646	\$ 4,223
West Virginia	\$ 4,404	\$ 2,605	\$ 7,008	\$ 16,967	\$ 3,245	\$ 20,212	\$ 13,204
Wisconsin	\$ 15,911	\$ 6,800	\$ 22,711	\$ 12,958	\$ 24,841	\$ 37,799	\$ 15,088
Wyoming	\$ 1,427	\$ 1,106	\$ 2,534	\$ 12,721	\$ 4,134	\$ 16,855	\$ 14,322
US Average							
Calculated Total	\$ 817,323	\$ 425,210	\$ 1,242,532	\$ 732,877	\$ 408,354	\$ 1,141,231	\$ (101,302)